Engaging Science in Support of Water Management Policy

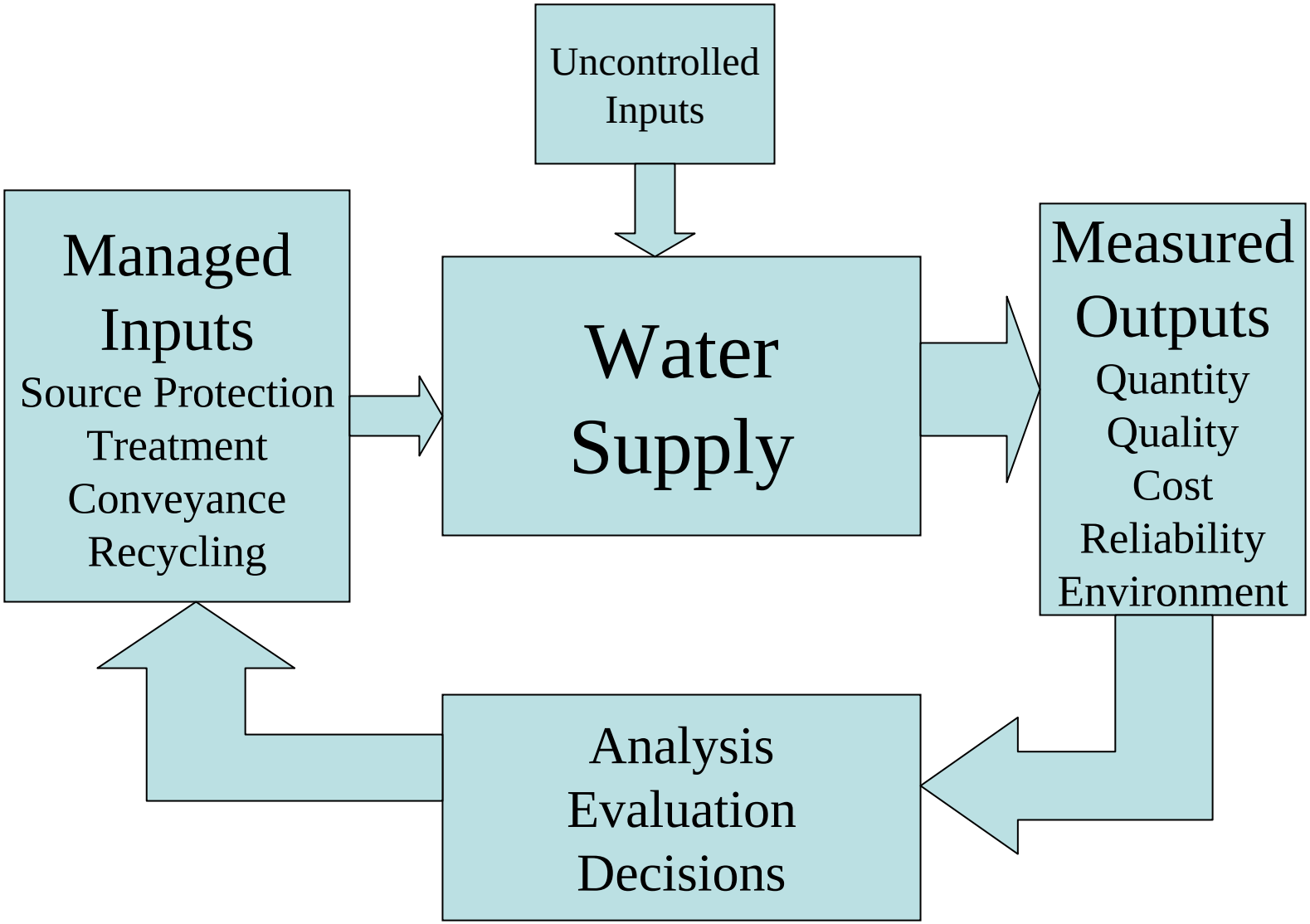
Michael Healey

Institute for Resources, Environment and Sustainability

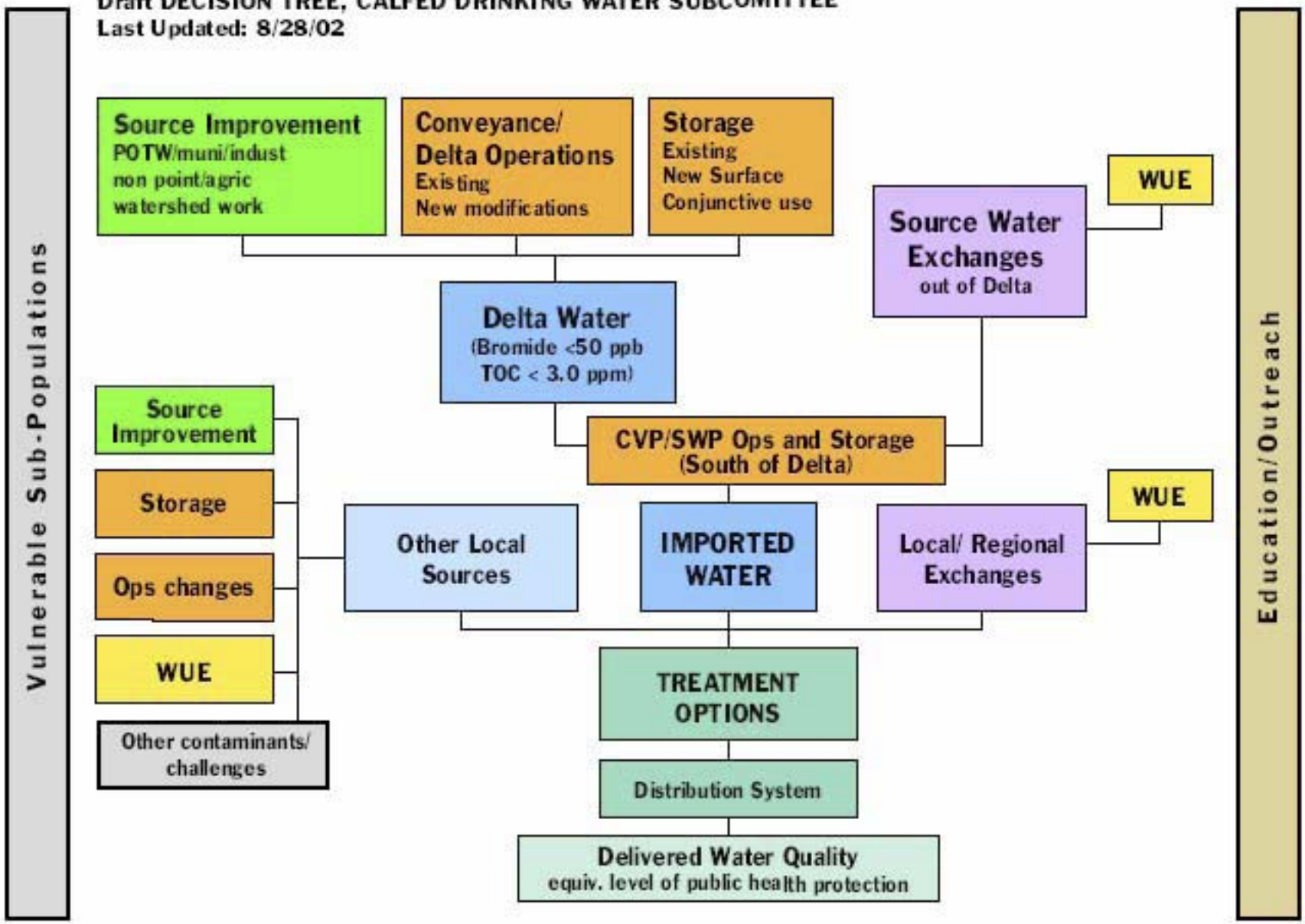
University of British Columbia

Some Fundamental Questions

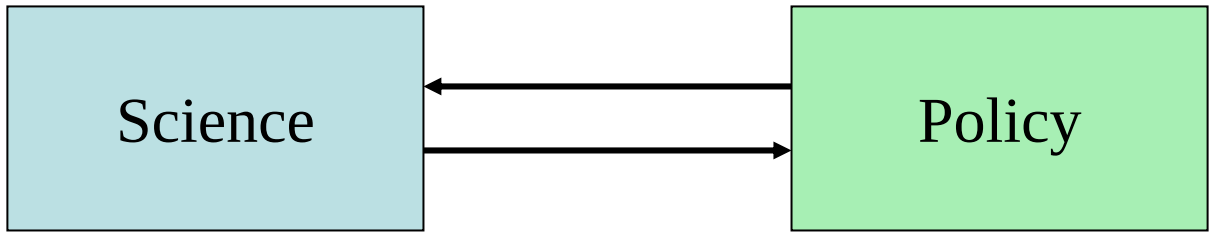
- What do we know about the systems we wish to manage?
- How can we use our knowledge to make better decisions?
- How should we engage science to help reduce uncertainty?
- How can we proceed in the face of high uncertainty?


Uncontrolled Inputs
Managed Inputs
Source Protection
Treatment
Conveyance
Recycling
Water Supply
Measured Outputs
Quantity
Quality
Cost
Reliability
Environment
Analysis
Evaluation
Decisions

EQUIVALENT LEVEL OF PUBLIC HEALTH PROTECTION
Draft DECISION TREE, CALFED DRINKING WATER SUBCOMITTEE
Last Updated: 8/28/02



The Two Solitudes Model

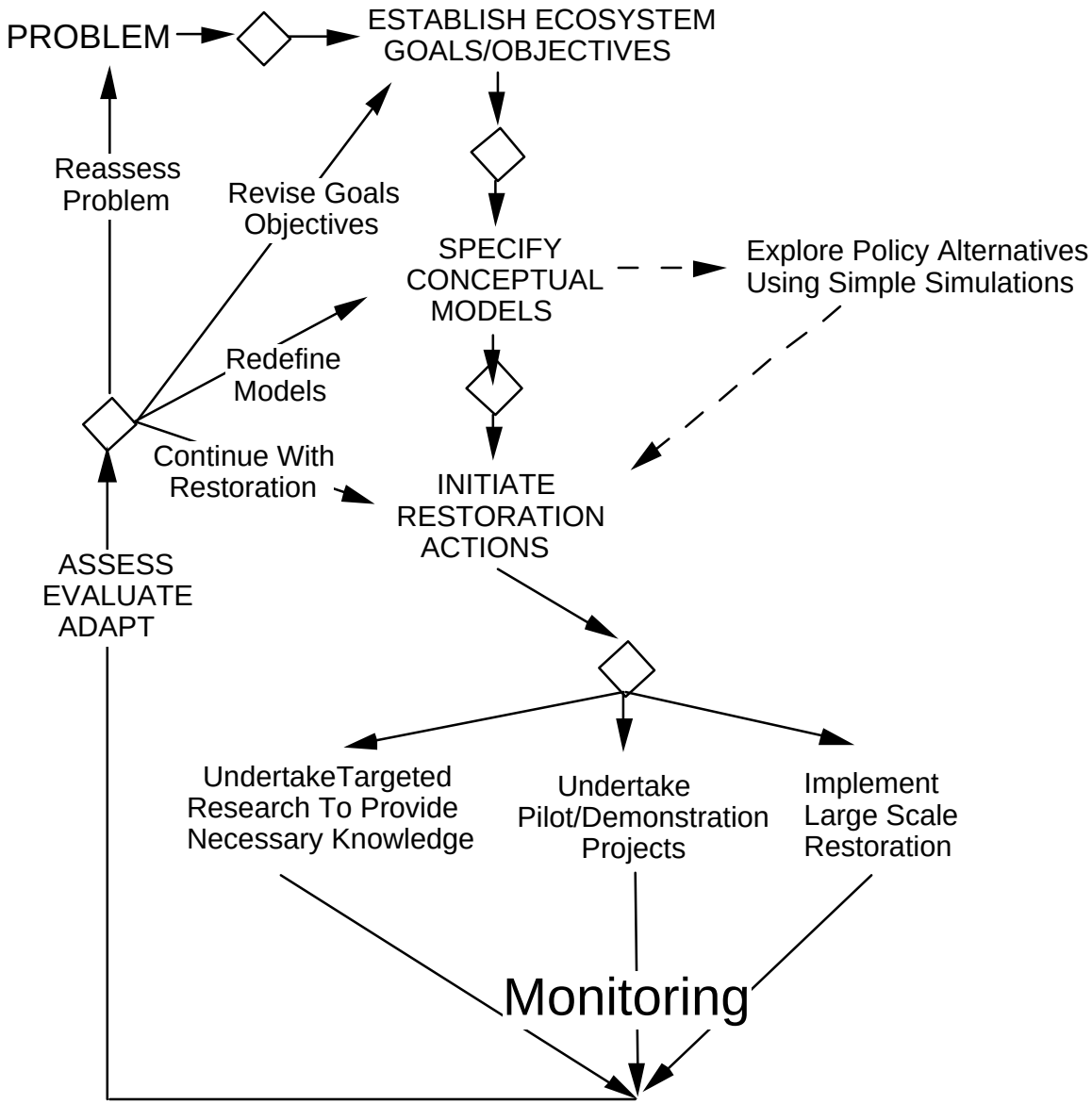


The Adaptive Management Model

What Is Adaptive Management?

- Colloquial: "Learning by doing"
- Formal: "An approach to designing and implementing resource management policy that takes account of uncertainty and maximizes the opportunity to learn from management actions"
- Practical: "Applying a medical model of problem solving to environmental problems rather than an engineering model"

Adaptive Management Flow Chart



The Regionalization Experiment

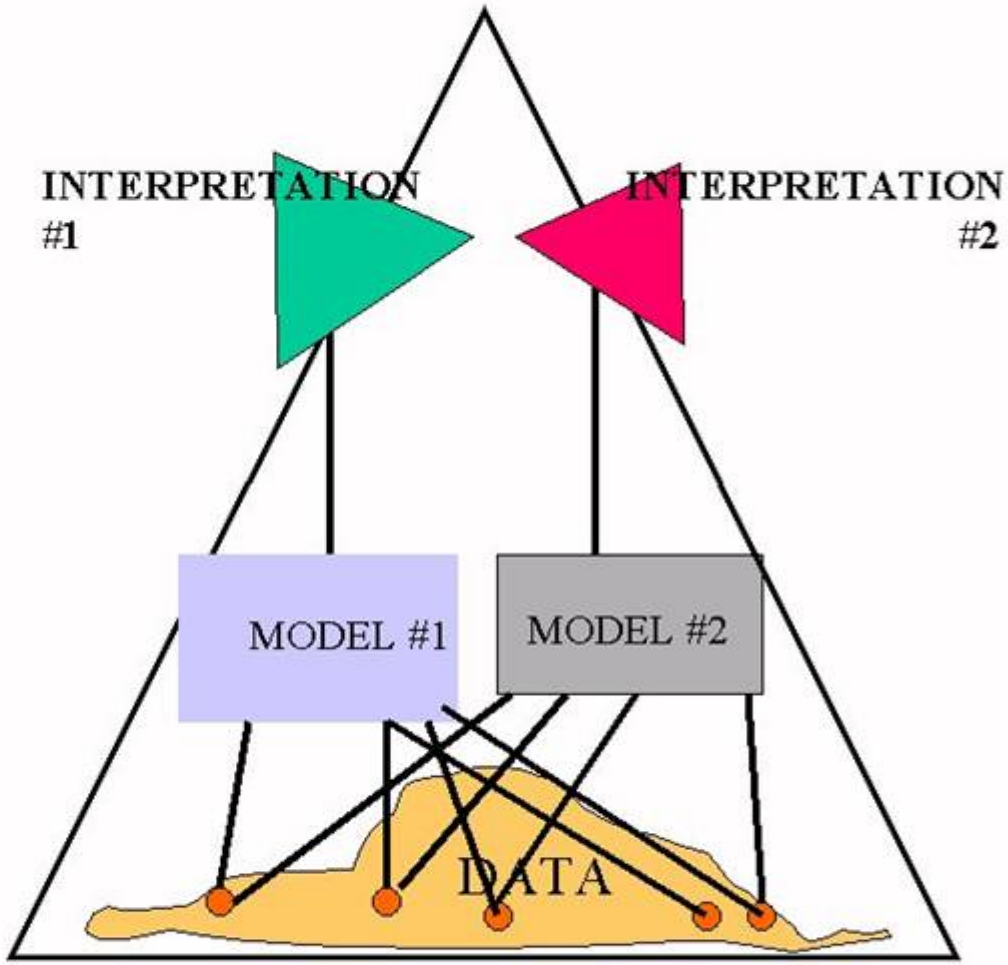
- A new state wide policy for water management decision making.
- Pilot experiment was Santa Anna Planning Area
- Developing a political consensus to implement
- Formal analysis to evaluate this alternative?
- Plans to monitor, evaluate and reassess??

Adversarial type 2:
Dueling Models

Same data

Two models

Two interpretations



Robert Twiss May 27, 2004

Some examples in global climate change, but not sure if we have this situation in CALFED planning.

Passive and Active AM

PASSIVE AM

- Choose Most Likely Model of System
- Determine Robust Management Policy
- Implement Policy and Monitor Results
- Adjust Policy Based on Results

ACTIVE AM

- Identify Competing Models of System
- Identify Effective Probing Policies
- Implement Policies and Monitor Results
- Identify Best Model and Proceed

The Governance Challenge

- Existing agencies express interest in AM but,

  - They are not well structured to do so.
- Every implementation represents an opportunity to learn but,

  - Those on the receiving end are risk averse.
- SOP’s and BMP’s can be obstacles to learning but,

  - Efficient delivery of services demands such standardization.

The Governance Challenge

- To learn means one must admit ignorance but,

  - Potential supporters demand certainty.
- Effective AM involves integration and collaboration but,

  - Agencies, NGO’s, Academics are used to operating in isolation

Summary

- Water management policy is characterized by large uncertainties that science could help resolve
- Adaptive management is a process for engaging science in the policy process to address uncertainty and promote learning
- The ERP is successfully implementing AM. Other components of CALFED might also benefit from adopting the adaptive management framework.